



Bridge Testing Program-UDOT

Salt Lake City, Utah

The Geopier GP3® System was chosen to provide compression, uplift and moment resistance for the reaction frame footings of two bridge bents being tested under cyclic lateral loading conditions.

Description: Under research grants funded through the NSF, FHWA, UDOT and the University of Utah, two bridge bents were tested to practical failure under cyclic lateral loading conditions simulating earthquake. Rammed Aggregate Pier® elements were used to provide compression loads of at least 150 kips, uplift loads of at least 175 kips and moment resistance for the reaction frame footings.

Subsurface Conditions: Soft Silt and clay sediment typical to the Salt Lake area.

Geopier Solution: In conjunction with the lateral load tests on the bridge bents, major research was undertaken for the design of the RAP elements supporting the reaction frame. Piers of 3', 6', 9', 12', and 15' lengths were tested to failure in both compression and tension. Geotechnical instruments were installed within the piers at various depth increments as well as within the matrix soils adjacent to the piers to monitor vertical and horizontal stresses during the testing. Similar instrumentation was installed that was ultimately constructed for the



reaction frame. Also, piezometers were installed in the matrix soils between piers to monitor pore water pressures during the cyclic testing of the bridge bents. Prior to the GP3 installation, each testing site and both reactions frame sites were explored and evaluated by means of drilling borings, Borehole Shear tests, stepped land tests, and cone petrometer.

PROJECT TEAM

Owner:

Utah Department of Transportation

Geotechnical Engineer:

University of Utah Geotech. Eng. Dept.

Structural Engineer:

University of Utah Geotech. Eng. Dept.

Geopier Installer:

Geopier Northwest

Geopier Designer:

GFC-Northwest